

# Zeroing In on a Confectionery Sunflower Blemish

Consumers naturally prefer that their confectionery sunflower snacks look good as well as taste good. So a couple of years ago, when sunflower farmers began seeing mysterious brown spots on the blunt end of their seeds, Agricultural Research Service scientists answered a call for help. Were the spots caused by a disease? An insect? Or both?

An answer and a solution to the problem remain crucial because farmers who produce sunflower seeds for the confection market end up selling the seeds for birdseed at low prices if more than 0.5 percent have the condition called kernel brown spot. Last year, the spots were found in 7 percent of seed samples from some fields.

"At first, we considered the type of fungus called *Alternaria* as a prime suspect," says ARS plant pathologist Thomas J. Gulya, of the Red River Valley Agricultural Research Center in Fargo, North Dakota.

But Gulya and ARS entomologist Laurence D. Charlet exonerated the fungus and are now pointing at the lygus bug, also known as the tarnished plant bug. It's an insect whose notoriety has been associated largely with cotton, but

hundreds of crops serve as hosts. In the Northern Great Plains, the quarter-inch-long lygus bugs thrive on increasing acreages of canola. Other tasty crops in the region include sugarbeets, safflower, buckwheat, and crambe.

Scientists at North Dakota State University are working with the ARS scientists to compare lygus bug populations in sunflower fields planted next to certain other crops. "So far, we've observed that sunflower, being a late-seeded or late-maturing crop, serves as a host plant for second-generation lygus bugs," says Charlet.

Though lygus bugs don't eat much—probably not enough to reduce sunflower crop yields—they have the nasty habit of injecting plant tissues, such as the developing seeds, with digestive enzymes and extracting nutrients with their pointy little mouthparts. The microscopic injuries thwart development of surrounding tissue and appear as big brown spots after the seed matures and is marketed and hulled.

In greenhouse studies, the scientists found kernel brown spot only in seeds from flowers they had covered with bags containing lygus bugs. In USDA insecticide trials at four sites, researchers

found less severe kernel brown spot where the plants had been sprayed well before harvest time with insecticides used to control the banded sunflower moth and the seed weevil. The same insecticides kill lygus bugs. To start learning what steps to take and when best to take them to minimize kernel brown spot, the scientists set up several types of experiments last summer.

The confectionery sunflower market has grown rapidly in recent years to sales in multimillions of dollars involving China alone. U.S. exports of the edible seeds to China grew from 300 metric tons in 1995 to 10,000 tons in 1999.—By **Ben Hardin**, formerly with ARS.

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